Appendix B. ABOB User Instructions

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Introduction

The ABOB main menu screen contains 8 buttons shown below in Figure B1.

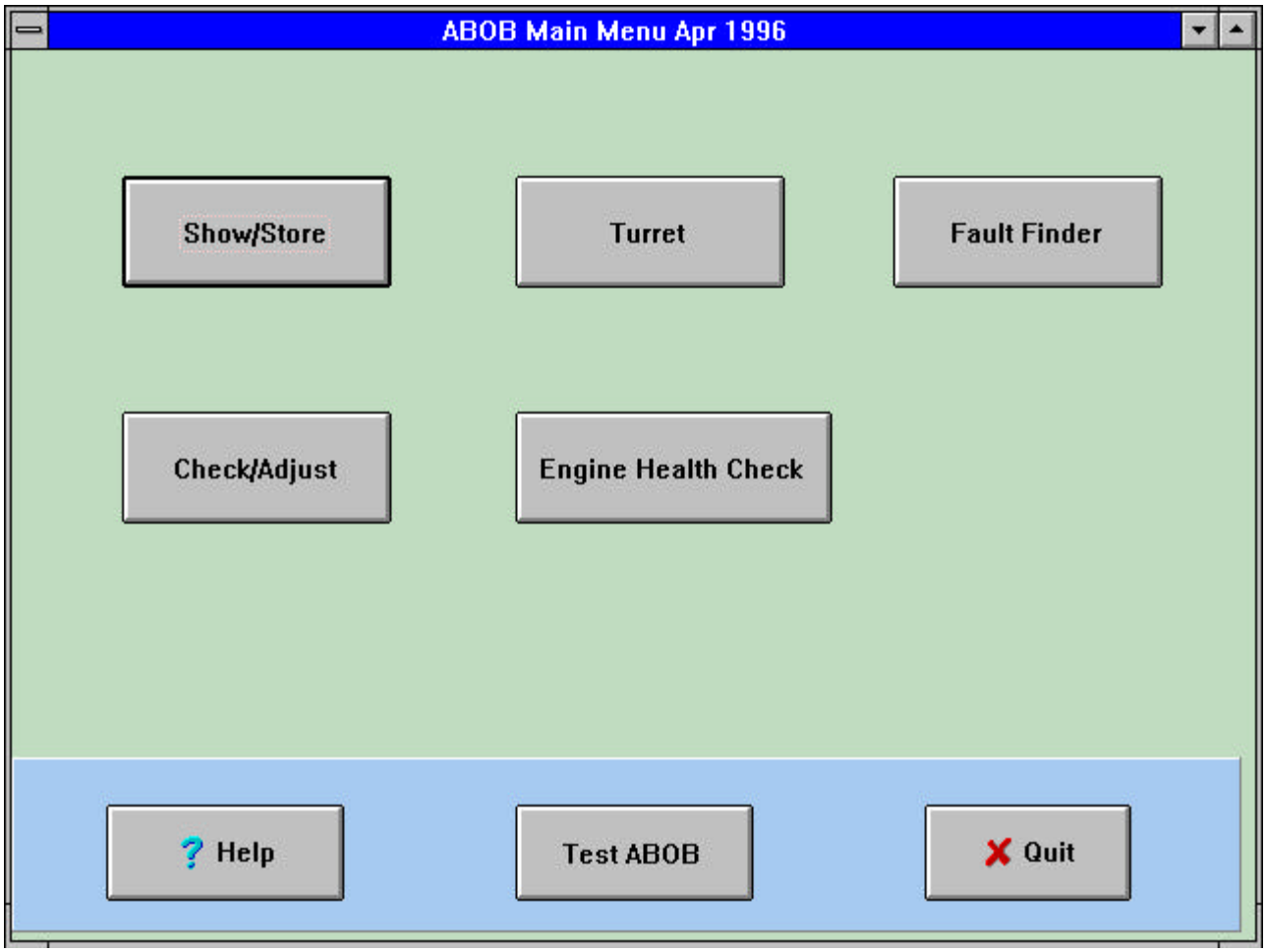

Figure B1. ABOB Main Menu

- **Show/Store** This button is used to display up to 32 pins on the screen and to store them to the disk for later viewing and analysis. See section Details of Show/Store for further information.
- **Turret** This button runs a program to view the signals from TNB-J1.
- **Fault Finder** This button runs a program to determine the cause of a "No Start" or a "Protective Mode". See section Fault Finder for details of this option.
- **Check/Adjust** This button is used for engine static adjustment checks (IGV, PTS, PLA). See section Check Adjust Menu for details of this option.
- **Engine Health Check** This button runs the engine health check. See section Engine Health Check for details.

Help This button starts a tutorial showing how to hook up the ABOB.

Test ABOB This button runs a self test on the ABOB and reports the results.

Quit This button will shut down the ABOB program and return to the TED main menu.

Details of Show/Store

Clicking the Show/Store button produces the screen shown in Figure B2.

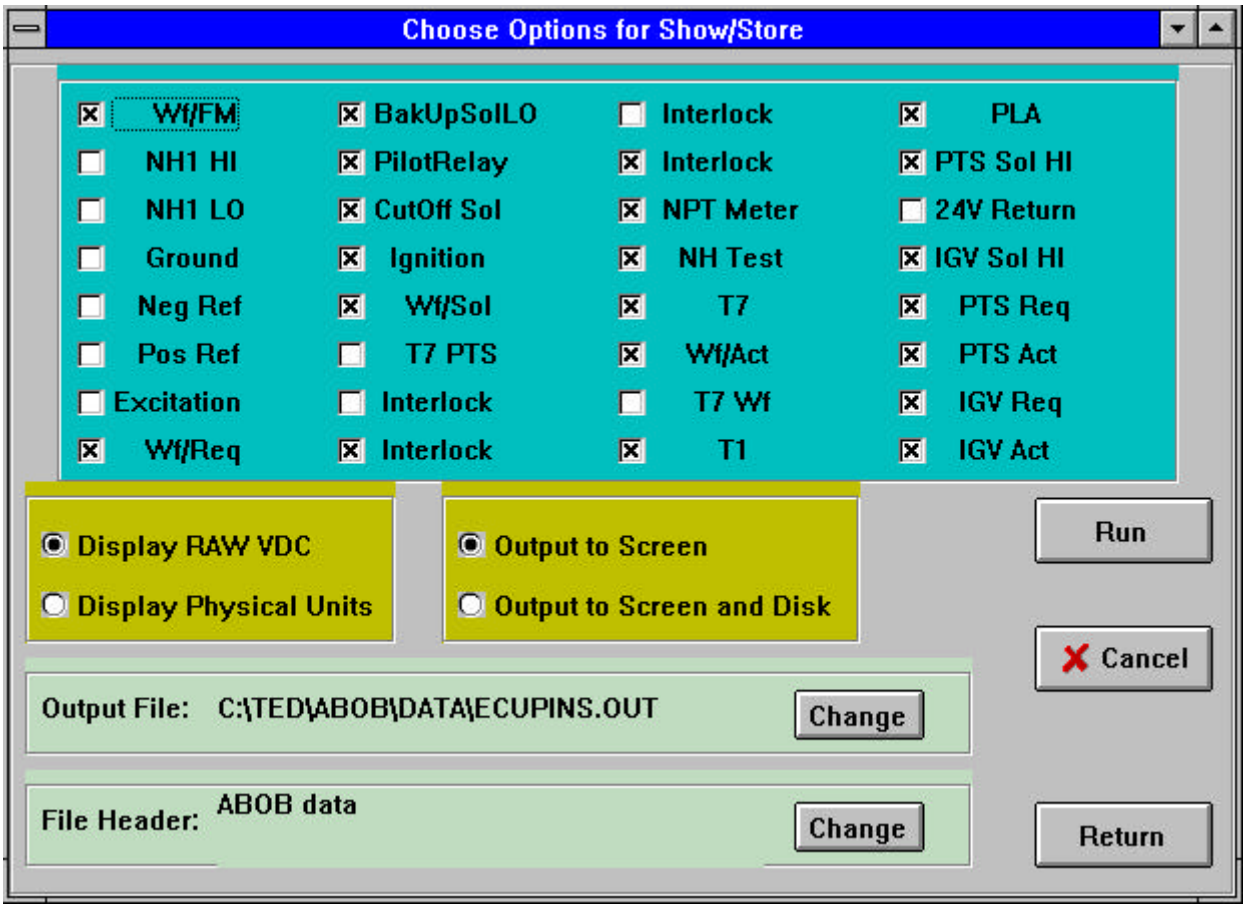

Figure B2. Choose Options for Show Store

The top part of the screen lists the 32 pins for the ECU J1 connector. You can select any number of pins to monitor. The 21 pins shown above are the default selection.

At the middle of the screen you can choose to display raw voltages or physical units, and you can select whether the output voltages are shown on your screen or are saved to a file on your hard drive.

If you choose to save output to the hard drive, you have the two options shown at the bottom of the screen. The default output file is:

c:\ted\abob\data\ecupins.out

When you change the output file, you have two choices. You can create a **new** file for your output, or you can append your data to an **existing** file. When you choose an existing file, the new voltages will be placed at the bottom of the file, and your old data will not be lost.

The default file header is: "ABOB data". The file header is a message that is placed in the output file just before the pin voltages. You can change the file header to describe the situation you are monitoring.

At the right of the screen are the 3 buttons, **RUN**, **CANCEL**, or **RETURN**.

RUN will use the choices that appear on the screen and show voltages to the screen (and to the disk if you choose that option). **Remember that ABOB will keep monitoring voltages until you click the STOP button.** This is important if you are storing data to the hard drive and your hard drive is low on space. ABOB will collect voltages at the rate of 1 MB per minute.

CANCEL will return to ABOB Main Menu without saving the options you have chosen.

RETURN will save the options you have chosen and then return to the ABOB Main Menu.

Fault Finder

Clicking the Fault Finder button will bring up the diagnostic screen shown in Figure B3.

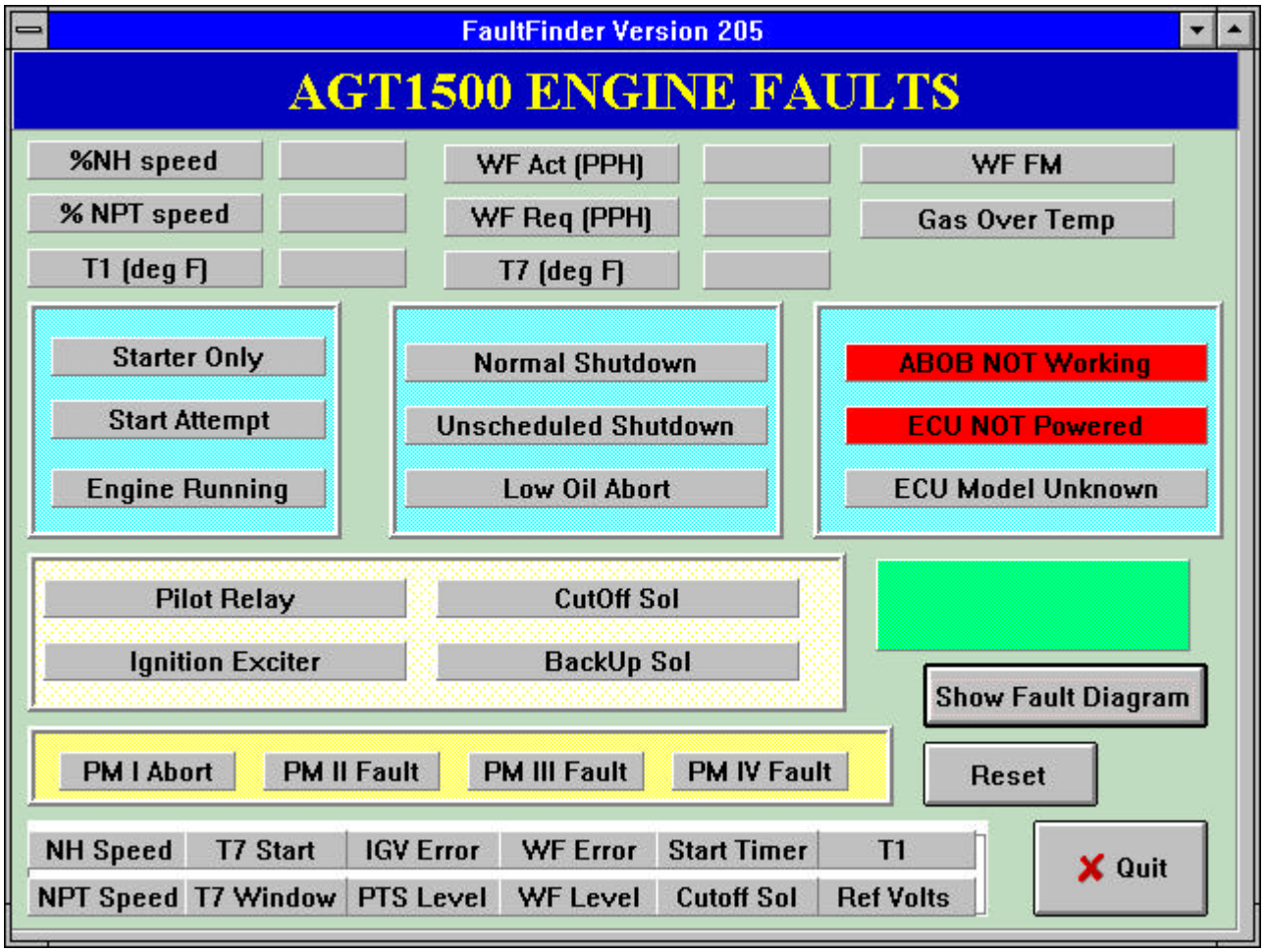

Figure B3. Fault Finder

At the top of the screen are 6 indicators that monitor NH, NPT, T1, WF Act, WF Req, and T7. To the right of this are two warning indicator lights, WF FM and Gas Over Temp. Below are 3 boxes with 3 indicators each. The left and middle group show the engine condition. One of these 6 will light in the appropriate situation. For example, during a start attempt, the **Start Attempt** button will light, and if the engine starts, then the **Engine Running** button will light. Below these three boxes is a box with 4 indicators, Pilot Relay, Ignition Exciter, CutOff Sol, and BackUp Sol. These buttons indicate whether the components are open or closed, powered or not powered. To the right of this box is a rectangle that displays a clock when a **Start Attempt** is detected. The clock will display elapsed time from beginning of a start attempt, then elapsed time from a successful start, then elapsed time from a shutdown.

Below to the left is a box containing the 4 Protective Mode indicators. These will light to indicate that a protective mode has been found. Below this is a list of 12 possible causes for protective modes. ABOB will attempt to find all possible causes for the fault and light the appropriate fault indicator. Note that below the clock is a button labeled **Show Fault Diagram.** Clicking this button will display a chart of all the protective modes found and their possible causes. See figure B4 below.

Clicking on the **Stop** button will shut down Fault Finder and return to the ABOB Main Menu.

Below is the fault diagram screen. ABOB can detect multiple faults and will turn the fault light red for every fault it detects.

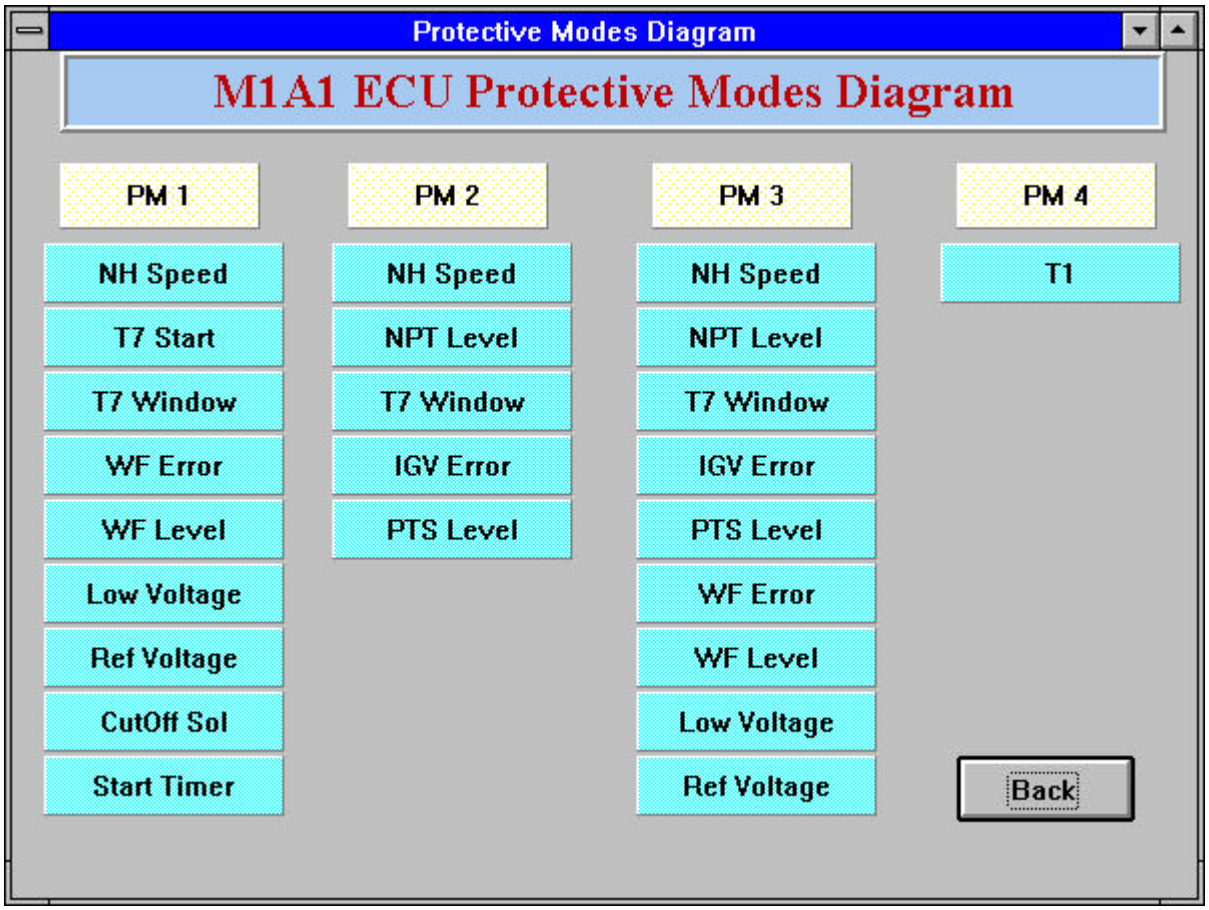

Figure B4. Fault Diagram

ABOB Check Adjust Menu

Clicking the Check/Adjust button opens the next menu shown below.

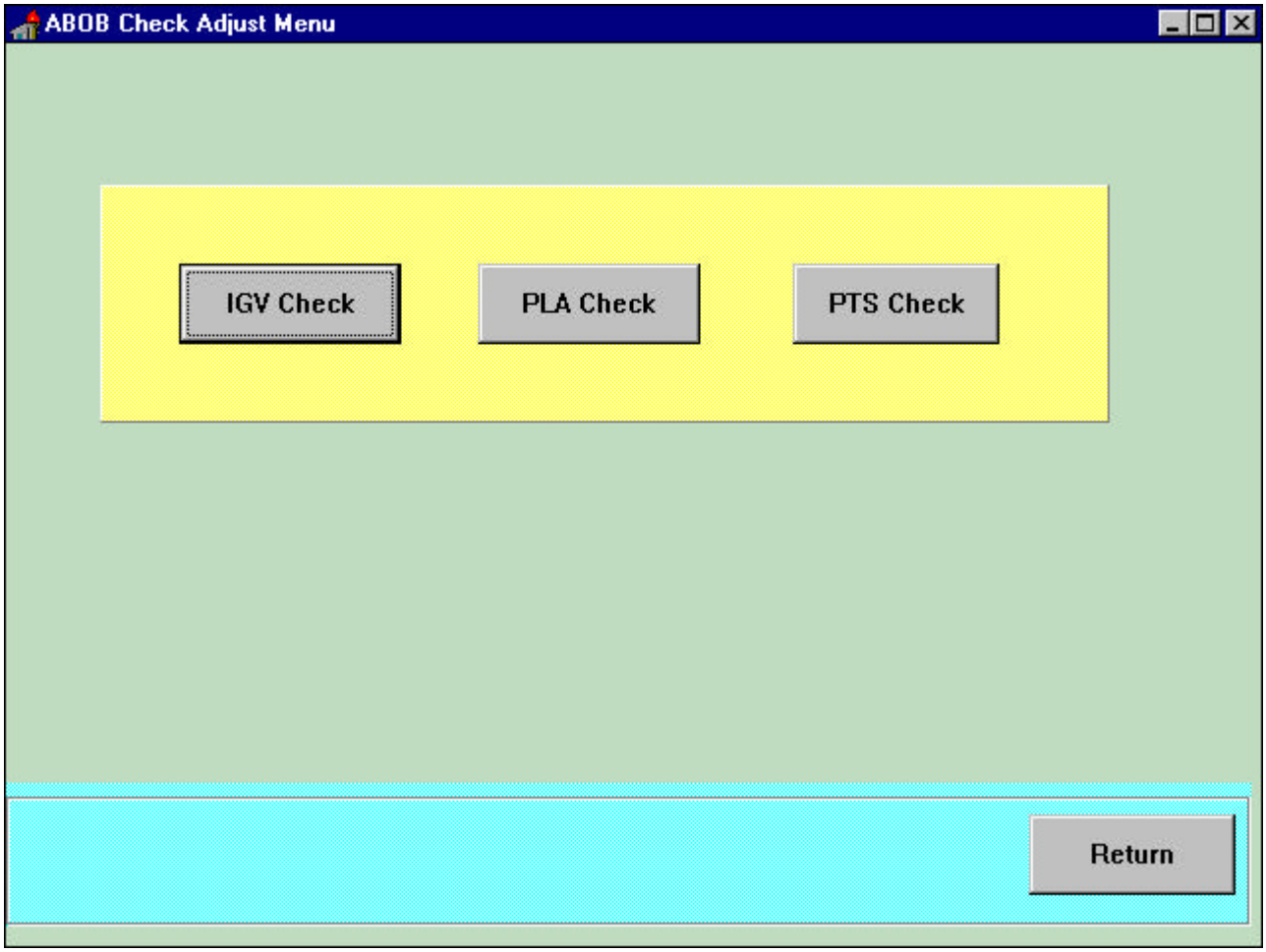

Figure B5. Check Adjust Menu

The 3 buttons in the middle of the screen all perform adjustment checks. The IGV Adjustment Check screen is shown below.

IGV Adjust Check

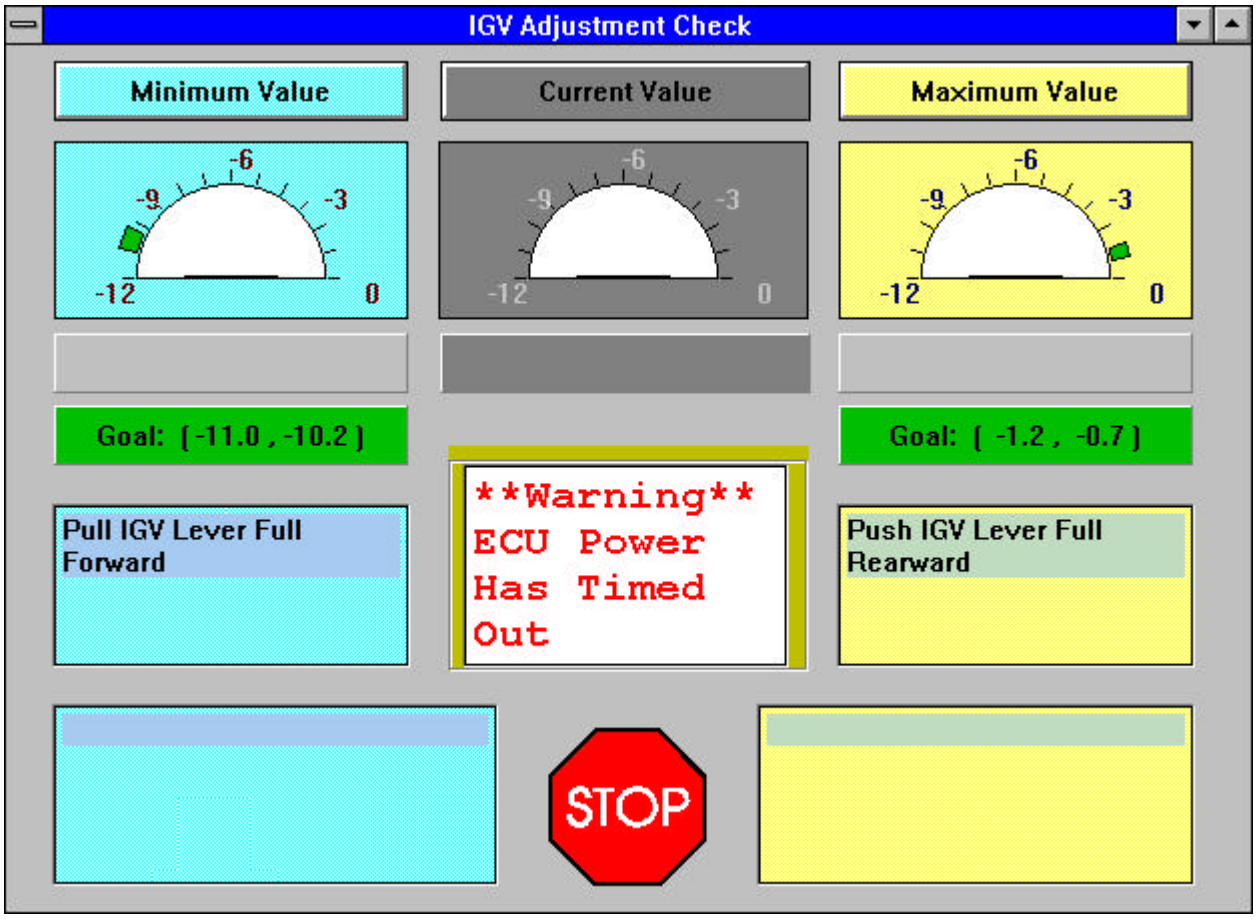

Figure B6. IGV Adjustment Check

The top part contains 3 gauges showing the Minimum, Current, and Maximum readings found. The results are displayed in both dial and digital form. Below the min and max sections are 2 boxes labeled "Goal", and beneath the Goal boxes are Instructions. For example, the instructions for the Minimum side say to "Pull IGV lever Full Forward". Below the instructions are two boxes which will display the status for the Minimum and Maximum positions. The box above the Stop sign shows PCP timeout messages. Recall that the PCP will remain powered for 45 seconds to perform these tests.

Engine Health Check

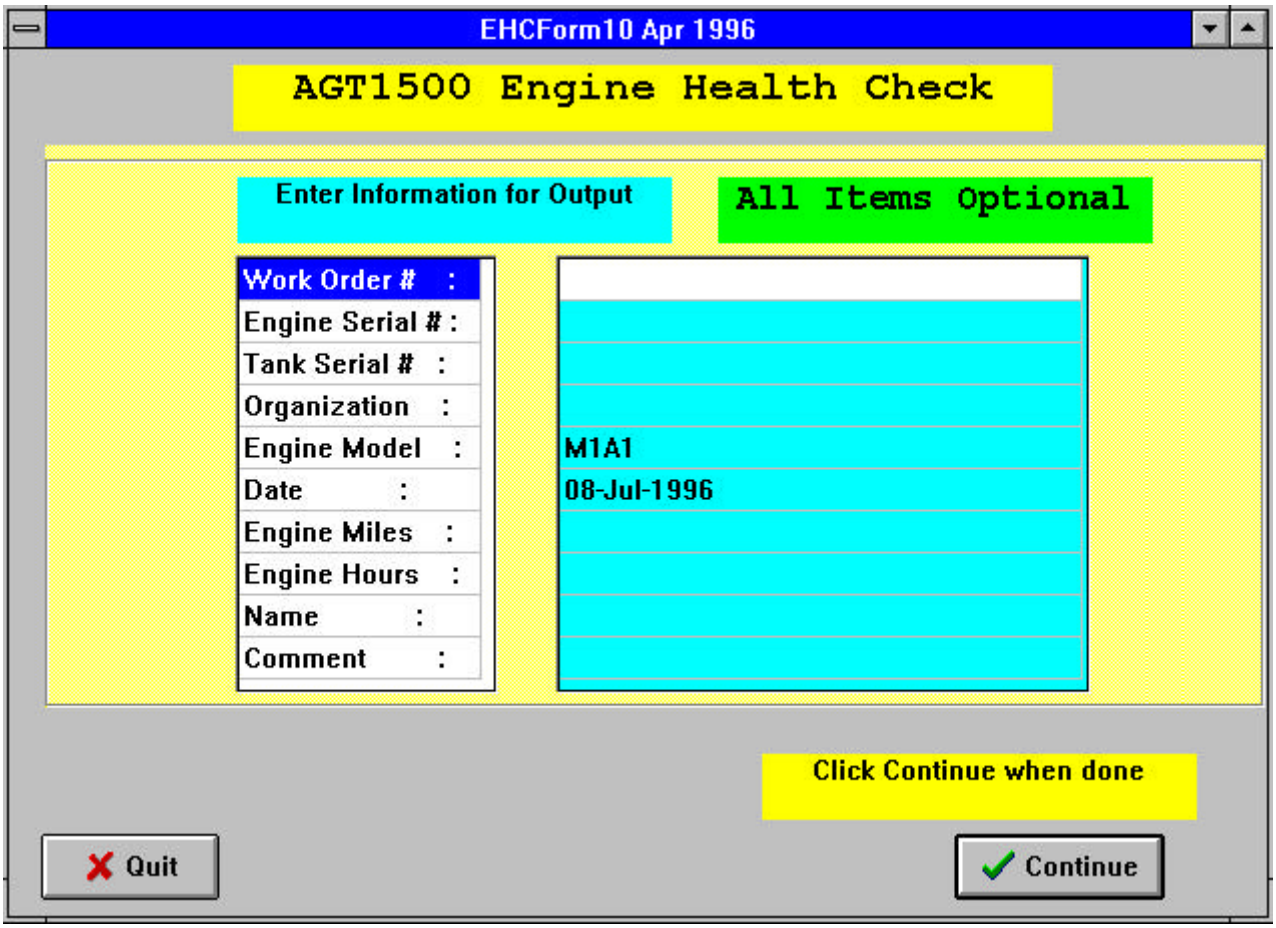

Figure B7. Engine Health Check First Screen

This option runs through a series of screens to perform the engine health check. The first screen asks for data on the engine. All items are optional. After you have entered your information, click the "Continue" button to proceed through the next series of screens.

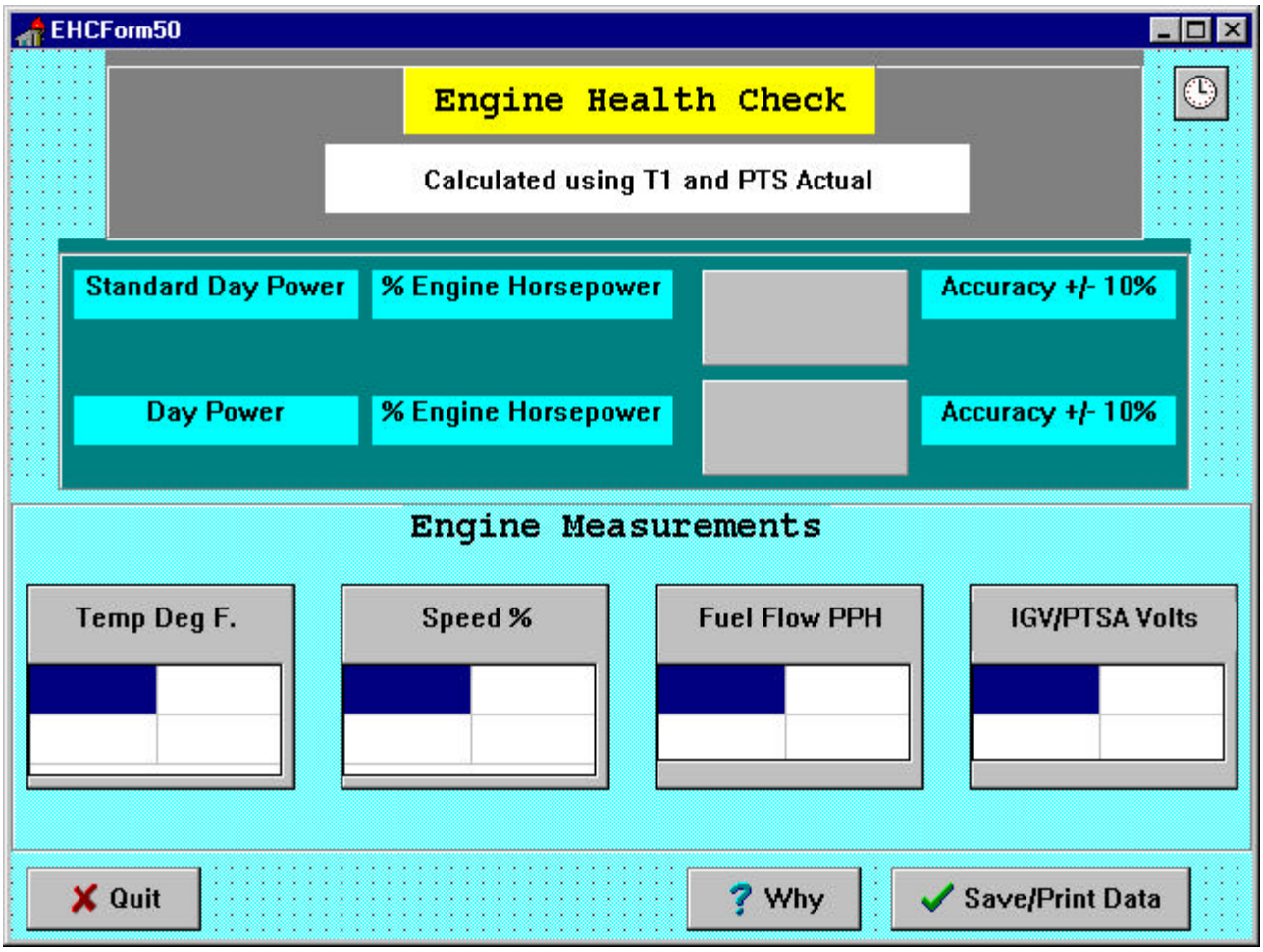

Figure B8. Engine Health Check Results

This screen shows the results of the health check. The top part shows 2 numbers. The first is currently called "Standard Day Power". It represents the health of the engine on an 87 def F day at sea level. The second number is currently called "Day Power". It represents engine performance at the time the health check is taken. The top number represents the health of the engine under ideal conditions. The bottom number represents the engine health under current condtions.

In the middle of the screen are 4 boxes with Temperature, Speed, Fuel, and IGV/PTSA readings for reference.

At the bottom right is the "Save/Print" button. This will bring up another screen asking for details so the engine health information can be saved to disk or sent to the printer.

How to Hook Up the ABOB

Step 1. Connect ABOB to J1 on the ECU using the proper adapter cable.

1. connect BOB cable Adapter #4 to J1 on the ECU

2. connect either:
    - BOB cable #1 to Adapter #4 OR
    - STE M1 cable CX304 to Adapter #4 OR
    - STE M1 cable CX305 to Adapter #4
3. connect above cable to J1 on ABOB

Step 2. Connect ABOB to the CTS computer.

- use the 9 pin cable
- hook one end to the 9 pin connector on ABOB
- hook the other end to the 9 pin serial port on the computer
- tighten the screws on both ends

Step 3. Install 3 jumper wires on ABOB

- between pins 0 and 4 (to establish ground)
- between pins 15 and 16 (to power the ECU)
- between pins 17 and 18

Step 4. Connect the power cord and turn the unit on

- the power switch will light if ABOB is getting power
- the small red light will blink if the ABOB computer is operating